



- a) providing a pair of primers complementary of the 5' and 3' ends of a double-stranded first native nucleic acid sequence;
- b) amplifying said first native nucleic acid sequence,
- c) isolating the amplification product thus obtained;
- d) annealing the amplification product with an adapter segment comprising an oligonucleotide sequence able to bind at least a portion of the nucleotide sequence of said amplified nucleic acid through Watson-Crick base pairing, said adapter segment being linked to a third strand oligonucleotide which comprises a base sequence capable of forming a triple helix at a binding region on one or both strands of a second native nucleic acid segment, thereby providing a nucleic acid targeting system comprising:
  - (i) said third strand oligonucleotide,
  - (ii) said amplification product as a donor nucleic acid segment, and
  - (iii) said adapter segment bound to said donor nucleic acid segment through Watson-Crick base pairing;
- e) introducing said nucleic acid targeting system into a cell comprising a second native nucleic acid different from the first native nucleic acid;
- f) allowing the third strand oligonucleotide to bind to the second native nucleic acid segment to form a triple helix nucleic acid, thereby inducing homologous recombination at the second native nucleic acid segment target region; and
- g) allowing homologous recombination to occur between the second native and donor nucleic acid segments.

4. (Original) The method according to claim 1, wherein the donor nucleic acid is selected from the group consisting of a double-stranded nucleic acid, a substantially complementary pair of single stranded nucleic acids and a single stranded nucleic acid.

5. (Previously presented) The method according to claim 1, comprising the steps consisting of:









(iii) an adapter segment comprising an oligonucleotide sequence able to bind at least a portion of said donor nucleic acid through Watson-Crick base pairing, the adapter segment being linked to said third strand oligonucleotide,

b) allowing the oligonucleotide to bind to the native nucleic acid segment to form a triple helix nucleic acid, thereby inducing homologous recombination at the native nucleic acid segment target region; and

c) allowing homologous recombination to occur between the native and donor nucleic acid segments,

thereby performing that gene alteration or mutation repair.

24. (Previously presented) The method according to claim 1, wherein said third strand oligonucleotide is a single DNA molecule of between 10 and 30 nucleotides.

25. (Previously presented) The method according to claim 1, wherein the adapter is a single-strand oligonucleotide comprising between 8 and 30 nucleotides.

26. (Previously presented) The method according to claim 12, wherein the hydrocarbon skeleton is interrupted and/or substituted by one or more heteroatoms, or heterogroups that comprise at least one of these heteroatoms.